

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
5 December 2002 (05.12.2002)

PCT

(10) International Publication Number
WO 02/096939 A3

(51) International Patent Classification⁷: C07K 14/075,
C12N 15/34, 15/86, 7/00, 5/10, A61K 48/00

(74) Agent: VOSSIUS & PARTNER; Siebertstrasse 4, 81675
München (DE).

(21) International Application Number: PCT/EP02/05942

(81) Designated States (*national*): AU, CA, JP.

(22) International Filing Date: 29 May 2002 (29.05.2002)

(84) Designated States (*regional*): European patent (AT, BE,
CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,
NL, PT, SE, TR).

(25) Filing Language: English

(26) Publication Language: English

Published:
— with international search report

(30) Priority Data:
60/293,974 30 May 2001 (30.05.2001) US

(88) Date of publication of the international search report:
6 November 2003

(71) Applicant: TRANSGENE S.A. [FR/FR]; 11, rue de Mol-
sheim, F-67082 Strasbourg Cedex (FR).

(72) Inventor: ROSA CALATRAVA, Manuel; 15, rue du
Neufeld, F-67100 Strasbourg (FR).

*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*



WO 02/096939 A3

(54) Title: ADENOVIRUS PROTEIN IX, ITS DOMAINS INVOLVED IN CAPSID ASSEMBLY, TRANSCRIPTIONAL ACTIVITY AND NUCLEAR REORGANIZATION

(57) Abstract: Described are adenovirus pIX proteins which are modified by mutating one or more amino acids and/or by the inclusion of a binding moiety. Preferably, said modification is carried out in the N-terminal part or in the C-terminal leucine-repeat of the pIX protein. It is described that viruses or virus-like particles containing such a modified pIX protein show an improved gene delivery efficiency. Furthermore, described are corresponding adenoviral vectors, viruses or virus-like particles, host cells, complementation cell lines and methods for producing such viruses or virus-like particles. In addition, described are pharmaceutical compositions comprising an adenoviral vector, virus or virus-like particle, host cell or complementation cell line as mentioned above and therapeutical applications thereof.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 02/05942

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K14/075 C12N15/34 C12N15/86 C12N7/00 C12N5/10
A61K48/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, SEQUENCE SEARCH, MEDLINE, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 36545 A (RIORDAN CATHERINE R O ; ARMENTANO DONNA (US); GENZYME CORP (US); RO) 22 July 1999 (1999-07-22)	1-3,5,8, 10-19
Y	abstract, p. 4:30-20:26, claims	6
X	WO 01 21216 A (UAB RESEARCH FOUNDATION) 29 March 2001 (2001-03-29)	1-3,5, 10-19
Y	abstract, p. 5:3-13:12, 15:25-16:27, claims	6,8
P,X	WO 01 58940 A (GENVEC INC) 16 August 2001 (2001-08-16)	1-6,8, 10-19
	abstract, p. 2:5-10:24, claims	
	--- -/-	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

Z document member of the same patent family

Date of the actual completion of the international search

14 July 2003

Date of mailing of the international search report

04/08/2003

Name and mailing address of the ISA

European Patent Office, P.B. 5618 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Puonti-Kaerlas, J

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 02/05942

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	LEISSNER P ET AL: "Influence of adenoviral fiber mutations on viral encapsidation, infectivity and in vivo tropism." GENE THERAPY, vol. 8, no. 1, January 2001 (2001-01), pages 49-57, XP002247417 ISSN: 0969-7128 abstract, p. 49-55 ---	1-6,8, 10-19
Y	WICKHAM T J: "TARGETING ADENOVIRUS" GENE THERAPY, MACMILLAN PRESS LTD., BASINGSTOKE, GB, vol. 7, no. 2, January 2000 (2000-01), pages 110-114, XP001055892 ISSN: 0969-7128 abstract, p. 112-113 ---	1-6,8, 10-19
A	RUSSELL W C: "Update on adenovirus and its vectors." JOURNAL OF GENERAL VIROLOGY, vol. 81, no. 11, November 2000 (2000-11), pages 2573-2604, XP002247418 ISSN: 0022-1317 ---	
A	LUTZ P ET AL: "The product of the adenovirus intermediate gene IX is a transcriptional activator" JOURNAL OF VIROLOGY, THE AMERICAN SOCIETY FOR MICROBIOLOGY, US, vol. 71, no. 7, 1997, pages 5102-5109, XP002173826 ISSN: 0022-538X -----	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 02/05942

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9936545	A	22-07-1999	AU 2321999 A	02-08-1999
			CA 2317941 A1	22-07-1999
			EP 1044274 A2	18-10-2000
			JP 2002508967 T	26-03-2002
			WO 9936545 A2	22-07-1999
WO 0121216	A	29-03-2001	AU 7709800 A	24-04-2001
			CA 2384827 A1	29-03-2001
			EP 1214098 A1	19-06-2002
			JP 2003509079 T	11-03-2003
			WO 0121216 A1	29-03-2001
			US 6555368 B1	29-04-2003
WO 0158940	A	16-08-2001	AU 3498101 A	20-08-2001
			WO 0158940 A2	16-08-2001
			US 2001047081 A1	29-11-2001